

## Claims

1. Method for ion beam processing of the surface of a substrate in which said substrate is positioned relative to an ion beam that is generated by an ion beam source and the known property pattern of the surface of said substrate is partially processed by said ion beam such that a new technologically defined property pattern is formed, characterized in that the current geometric action pattern of said ion beam on said surface (15) of said substrate (8) is adjusted as a function of the known property pattern and of the new technologically defined property pattern and as a function of the method progress by modifying the beam characteristics and/or by pulsing the ion beam.
2. Method for ion beam processing in accordance with claim 1, characterized in that said substrate (8) and the ion beam source (1) rotate relative to one another and/or are moved uniformly or non-uniformly linearly, in a circle, or in a technologically pre-specified direction.
3. Method for ion beam processing in accordance with claim 1 or 2, characterized in that said ion beam is formed from at least two individual ion beams whose beam characteristics are controlled synchronously or independent of one another and/or are pulsed simultaneously or temporally offset from one another.
4. Method for ion beam processing in accordance with any of claims 1 through 3, characterized in that the angle between the surface normal of said surface of said substrate to be processed and the axis of said ion beam striking said surface is modified.
5. Method for ion beam processing in accordance with any of claims 1 through 4, characterized in that the current geometric action pattern of said ion beam on said surface (15) of said substrate (8) is measured prior to and/or during the course of said method by means of an ion probe array (9) that is arranged in the plane of said surface (15) of said substrate (8) to be processed.

6. Apparatus for ion beam processing of said surface of a substrate in accordance with a method in claims 2 through 5, characterized in that present within a vacuum chamber is a substrate support for mounting at least one substrate (8) that can be moved in a Y axis (4) and in an X axis (6) and in that an ion beam source (1) is mounted in the wall of said vacuum chamber such that the axis of an ion beam from said ion beam source (1) is perpendicular to said surface (15) of said substrate (8) to be processed in the Z axis (11) or can be arranged in an axis that is inclined to said Z axis, whereby the distance from said ion beam source (1) to said surface (15) of said substrate (8) to be processed can be fixed or variable.
7. Apparatus in accordance with claim 6, characterized in that said ion beam source is formed from at least two individual ion beam sources, the individual ion beams of which form a common current geometric action pattern of said ion beam on said surface of said substrate.